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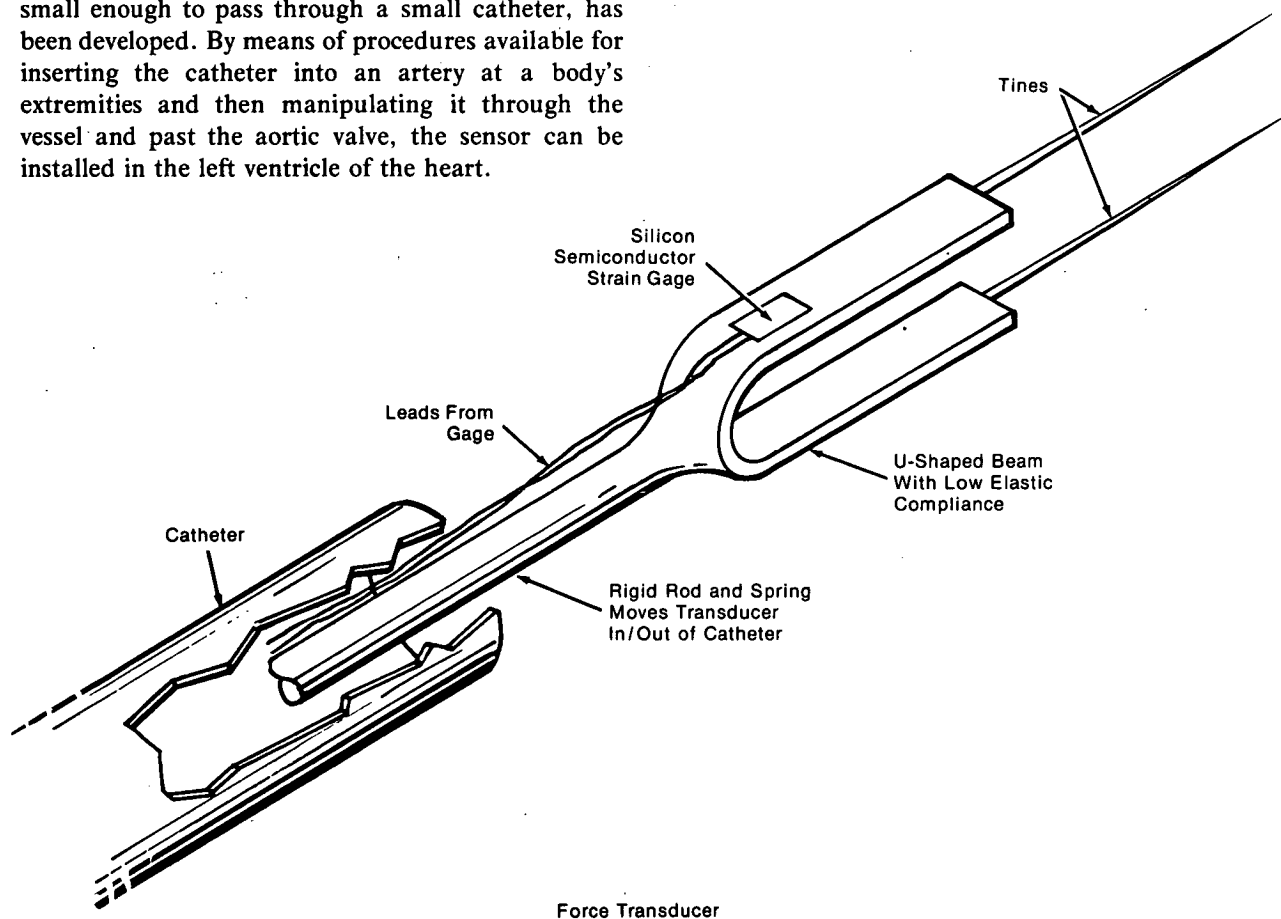
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Catheter-Tip Force Transducer for Cardiovascular Research

Since a major component of current heart research is devoted to the study of regional myocardial mechanics, the design of biofunction sensors used to record the dynamic force activity within the heart can be of considerable importance. In particular, a sensor capable of being implanted within the heart without opening the chest would be valuable, because it would lessen the impact of the sensor on the measured parameters and avoid surgery-induced trauma.

Such a sensor, which consists of a force transducer small enough to pass through a small catheter, has been developed. By means of procedures available for inserting the catheter into an artery at a body's extremities and then manipulating it through the vessel and past the aortic valve, the sensor can be installed in the left ventricle of the heart.

The force transducer, shown in the illustration, consists of a miniature U-shaped beam of low elastic compliance with sharp tines rigidly attached to the ends. These tines are used to implant the transducer into the interior wall of the myocardium, once the catheter has been positioned inside the heart. A semiconductor sensing element attached to one side of the U-shaped beam is connected to two electrical leads for excitation and output. The conditioned



(continued overleaf)

output signal can be processed by any instrument such as an oscilloscope for measurement, observation, and display.

In this manner, the sensing device has been used successfully to measure the dynamic force field in the myocardium of an anesthetized dog. An additional feature of the device is that the metallic tines of the transducer can be used as the internal electrode for an electrocardiogram.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
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Reference: TSP75-10211

Patent status:

This invention is owned by NASA, and a patent application has been filed. Inquiries concerning non-exclusive or exclusive license for its commercial development should be addressed to:

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